

CONTENTS OF VOLUME 90

Vol. 90A, No. 1

G. A. Kerkut

- 1 The origins of *Comparative Biochemistry and Physiology* (Written in celebration of the 40th anniversary year of the foundation of Pergamon Press, 1948–1988)

Mini Reviews

G. A. Kerkut

- 5 Possible evolutionary futures for mankind

R. F. Burton

- 11 The protein content of extracellular fluids and its relevance to the study of ionic regulation: net charge and colloid osmotic pressure

C. R. McCrohan

- 17 Modification of central pattern generation in invertebrates

General Papers

Stephen Garnett

- 23 Digestion, assimilation and metabolism of captive estuarine crocodiles, *Crocodylus porosus*

S. Morris, A. C. Taylor and C. R. Bridges

- 31 Response of haemolymph oxygen affinity to simultaneous salinity and oxygen stress in the intertidal prawn, *Palaemon elegans* (Rathke)

A. J. Hulbert and Craig A. Williams

- 41 Thyroid function in a lizard, a tortoise and a crocodile, compared with mammals

W. Vlok and J. H. J. Van Vuren

- 49 Chemical composition of blood and seminal plasma of *Barbus aeneus* (Cyprinidae)

Robert E. Gatten Jr

- 53 Cardiovascular correlates of exercise in snapping turtles, *Chelydra serpentina*

Joseph J. Souza, John J. Poluhowich and Richard J. Guerra

- 57 Orientation responses of American eels, *Anguilla rostrata*, to varying magnetic fields

Hein H. du Preez and Andrew C. Cockcroft

- 63 Nonfaecal and faecal losses of *Pomadasys commersonni* (Teleostei: Pomadasyidae) feeding on the surf clam, *Donax serra*

Hein H. du Preez and Andrew C. Cockcroft

- 71 Nonfaecal and faecal losses of the marine teleost, *Lichia amia* (Linnaeus, 1758), feeding on live southern mullet, *Liza richardsonii* (Smith, 1846)

Tohru Suzuki

- 79 Ultrastructure of the excretory organs and urinary component of the marine bivalve, *Atrina* (S.) *pectinata*

Charles D. Derby and Sheenan Harpaz

- 85 Physiology of chemoreceptor cells in the legs of the freshwater prawn, *Macrobrachium rosenbergii*

Brian A. Edwards and Alison R. Peters

- 93 Water balance during saline imbibition in the Mongolian gerbil (*Meriones unguiculatus*)

Hiroshi Tazawa, J. Scott Turner and Charles V. Paganelli

- 99 Cooling rates of living and killed chicken and quail eggs in air and in helium–oxygen gas mixture

J. E. Bly, M. A. Cuchens and L. W. Clem

- 103 Temperature mediated processes in teleost immunity: differential abilities of channel catfish T and B lymphocytes to cap membrane antigen

Izuru Kakuta	109	The role of non-protein nitrogenous compounds in osmotic regulation of <i>Tridentiger obscurus</i> and <i>T. brevispinis</i>
Sonia Brazil Romero and Anette Hoffmann	115	A technique for recording the electrocardiogram of <i>Megalo-</i> <i>lobulimus</i> sp. (Mollusca: Gastropoda: Pulmonata) during activity
J. van der Westhuyzen	117	Haematology and iron status of the Egyptian fruit bat, <i>Rousettus aegyptiacus</i>
B. M. Rugangazi and G. M. O. Maloiy	121	Studies on renal excretion of potassium in the dik-dik antelope
Peter B. Kimmel	127	Plasma cathepsin activity and the role of hypovolemic shock in dehydrational death in the toad, <i>Bufo marinus</i>
Elizabeth Blasco and Richard B. Forward Jr	135	Osmoregulation of the xanthid crab, <i>Panopeus herbstii</i>
Cristina Busch	141	Consumption of blood, renal function and utilization of free water by the vampire bat, <i>Desmodus rotundus</i>
Hiroyuki Naora, Ikuo Takabatake and Tetsuro Iga	147	Spectral sensitivity of melanophores of a freshwater teleost, <i>Zacco temminckii</i>
V. P. Bindokas and M. E. Adams	151	Hemolymph composition of the tobacco budworm, <i>Heliothis</i> <i>virescens</i> F. (Lepidoptera: Noctuidae)
Lynnette M. Sievert, Gregory A. Sievert and Paul V. Cupp Jr	157	Metabolic rate of feeding and fasting juvenile midland painted turtles, <i>Chrysemys picta marginata</i>
A. C. Thompson and P. P. Sikorowski	161	Effect of antibiotics on the physical and biochemical properties of irradiated boll weevil adults (<i>Anthonomus grandis</i> Boh.)
A. Waldschmidt and E. F. Müller	169	A comparison of postnatal thermal physiology and energetics in an altricial (<i>Gerbillus perpallidus</i>) and a precocial (<i>Acomys</i> <i>cahirinus</i>) rodent species
Susan E. Ford and Harold H. Haskin	183	Comparison of <i>in vitro</i> salinity tolerance of the oyster parasite, <i>Haplosporidium nelsoni</i> (MSX) and hemocytes from the host, (<i>Crassostrea virginica</i>)
H. Bernard Hartman	189	The muscles controlling courtship stridulation in the cock- roach, <i>Nauphoeta cinerea</i>
Carol N. Rowsemitt, Clement J. Welsh, Mary C. Kuehl, Robert E. Moore and Larry L. Jackson	195	Hormonal regulation of preputial gland function in male <i>Microtus montanus</i> , the montane vole
R. Gilles, A. Pequeux and A. Bianchini	201	Physiological aspects of NaCl movements in the gills of the euryhaline crab, <i>Eriocheir sinensis</i> , acclimated to fresh water

Vol. 90A, No. 2

Review

P. M. W. Janssens	209	The evolutionary origin of eukaryotic transmembrane signal transduction
-------------------	-----	--

General Papers

S. M. Mohamed, B. H. Ali and T. Hassan	225	Some effects of water deprivation on Dorcas gazelle (<i>Gazella</i> <i>dorcas</i>) in the Sudan
A. I. Alayash, A. M. El-Hassan, R. Omer and J. Bonaventura	229	Glycosylated haemoglobin: an indicator of long-term blood glucose in domestic sheep and goats

- I. I. Kruman, E. N. Ilyasova,
S. A. Rudchenko and Z. S. Khurkhulu 233 The intestinal epithelial cells of ground squirrel (*Citellus undulatus*) accumulate at G₂ phase of the cell cycle throughout a bout of hibernation
- O. M. Abdalla, I. A. Wasfi and F. A. Gadir 237 The Arabian race camel normal parameters—I. Haemogram, enzymes and minerals
- J. A. Tur, R. V. Rial, J. M. Rayó,
S. A. Tárraga and M. C. Dameto 241 Developmental study of digestive motor response to dietary pattern in young broilers
- María G. Rovedatti, Patricia M. Castañé,
Alfredo Salibián and Sonia Espina 249 Studies on the urinary nitrogen waste products in South American anurans from different habitats
- Barend Verachtert and Arnold De Loof 253 Experimental reversal of the electric field around vitellogenic follicles of *Sarcophaga bullata*
- G. Theophilidis 257 The study of action potential propagation failure at the branching point of an insect motor axon
- Nancy J. Berner and Rolf L. Ingermann 265 Interaction of exogenous proteins with the jelly coat of eggs from the salamander, *Ambystoma macrodactylum*
- C. Janse, G. J. van der Wilt,
M. van der Roest and A. W. Pieneman 269 Intracellularly recorded responses to tilt and efferent input of statocyst sensory cells in the pulmonate snail *Lymnaea stagnalis*
- M. E. White, E. N. Powell, S. M. Ray,
E. A. Wilson and C. E. Zastrow 279 Metabolic changes induced in oysters (*Crassostrea virginica*) by the parasitism of *Boonea impressa* (Gastropoda: Pyramidellidae)
- Yoshio Takei, Yuji Okawara and
Hideshi Kobayashi 291 Drinking induced by cellular dehydration in the quail, *Coturnix coturnix japonica*
- C. A. Leech and R. B. Moreton 297 Fast flickering of a potassium channel in glial cells from the cockroach central nervous system
- R. R. Harris and D. Bayliss 303 Gill (Na⁺ + K⁺)-ATPases in decapod crustaceans: distribution and characteristics in relation to Na⁺ regulation
- G. A. Bubenik, J. H. Smith and A. Flynn 309 Plasma levels of β -endorphin in white-tailed deer: seasonal variation and the effect of thyroxine, GnRH, dexamethasone and ACTH administration
- A. Bianchini, A. Pequeux and R. Gilles 315 Effects of TAP and DPC on the transepithelial potential difference of isolated perfused gills of the fresh water acclimated crab, *Eriocheir sinensis*
- Hilkka Reunanen, Pirkko Hirsimäki and
Eeva-Liisa Punnonen 321 Cytochemical studies on induced autophagocytosis in mouse exocrine pancreas
- Etsumori Harada and Bunei Syuto 329 Biliary and pancreatic exocrine secretions via endogenous secretin by intestinal infusion of propionate and propionate analogues in piglets
- J. R. Speakman and P. A. Racey 337 Consequences of non steady-state CO₂ production for accuracy of the doubly labelled water technique: the importance of recapture interval
- Philip J. Stephens 341 The effects of temperature and ethanol on the properties of the fast excitatory axon to the crab limb bender muscle
- Osamu Matsushima 349 Accumulation and conservation of free amino acids in isolated bivalve foot muscle exposed to hyperosmotic conditions
- S. Hoshino, M. Suzuki, T. Kakegawa,
K. Imai, M. Wakita, Y. Kobayashi and
Y. Yamada 355 Changes in plasma thyroid hormones, luteinizing hormone (LH), estradiol, progesterone and corticosterone of laying hens during a forced molt

Mini-Review

René Groscolas

- 361 The use of body mass loss to estimate metabolic rate in fasting sea birds: a critical examination based on emperor penguins (*Aptenodytes forsteri*)

General Papers

John P. Giesy

- 367 Phosphoadenylate concentrations and adenylate energy charge of largemouth bass (*Micropterus salmoides*): relationship with condition factor and blood cortisol

Betty L. Black

- 379 Development of glucose active transport in embryonic chick intestine. Influence of thyroxine and hydrocortisone

W. Vlok and J. H. J. Van Vuren

- 387 Physical composition of the semen of *Barbus aeneus*, the smallmouth yellowfish (Cyprinidae)

William A. Dunson and Frank J. Mazzotti

- 391 Some aspects of water and sodium exchange of freshwater crocodilians in fresh water and sea-water: role of the integument

D. H. Spaargaren

- 397 Low temperature halogen accumulation in the brown shrimp, *Crangon crangon* (L.)

Locke Rowe, Michael Berrill and Lois Hollett

- 405 The influence of season and pH on mortality, molting and whole-body ion concentrations in nymphs of the mayfly *Stenonema femoratum*

M. S. El-Sayed and J. H. Brackenbury

- 409 Sexual maturity and physical exercise alter fibrinolytic activity in birds (chickens)

Klaus Kriesten and Uwe Murawski

- 413 Concentrations of serum cortisol, progesterone, estradiol-17 β , cholesterol and cholesterol ester in the doe during the reproductive stadium, in the fetal serum, in the amniotic fluid and in the milk of rabbits, as well as correlations between these parameters

Edward J. Robel

- 421 Levels of calcium and soluble collagen in turkey egg shell membranes

Sandra E. Shumway, Christine Bogdanowicz and David Dean

- 425 Oxygen consumption and feeding rates of the sabellid polychaete, *Myxicola infundibulum* (Renier)

Pierre Magniez and Jean-Pierre Féral

- 429 The effect of somatic and gonadal size on the rate of oxygen consumption in the subantarctic echinoid *Abatus cordatus* (Echinodermata) from Kerguelen

Beatriz Fuentes Pardo and Enrique Moreno Sáenz

- 435 Action of deuterium oxide upon the ERG circadian rhythm in crayfish, *Procambarus bowieri*

Minna Hsu, John D. Harder and Sheldon I. Lustick

- 441 Seasonal energetics of opossums (*Didelphis virginiana*) in Ohio

David T. Booth

- 445 Respiratory quotient of Malleefowl (*Leipoa ocellata*) eggs late in incubation

Stephen R. Weiss and John M. Burns

- 449 The effect of acute treatment with two goitrogens on plasma thyroid hormones, testosterone and testicular morphology in adult male rats

Margaret R. Kasschau and M. Susan Prill

- 453 Comparative effects of sugars on the hemolytic activity of *Schistosoma mansoni* and other hemolytic agents

A. J. Smolenski and R. W. Rose

- 459 Comparative lactation in two species of rat-kangaroo (Marsupialia)

Anselm Frick and Ahmet Toygar	465	Lack of effect of rat atrial natriuretic factor (rANF) on the renal function in frogs
Anselm Frick and Ahmet Toygar	471	Reabsorption of inorganic sulfate in the frog kidney: saturation of transport mechanism
Karen Davenport Atnip, E. P. Kirby Hade and Donald J. Donaldson	475	N-acetylglucosamine binding activity in extracts of adult newt skin
Sandra A. Mercer, Harry W. Colvin Jr and Robert C. Backus	481	Elevated intra-rumen pressure and secondary rumen contractions in sheep (<i>Ovis aries</i>)
S. Merkle and W. Hanke	491	Long-term starvation in <i>Xenopus laevis</i> Daudin—II. Effects on several organs
Yehuda Arieli, Lissa Peltonen and Jacob Marder	497	Reproduction of rock pigeon exposed to extreme ambient temperatures
R. W. Gauldie and D. G. A. Nelson	501	Aragonite twinning and neuroprotein secretion are the cause of daily growth rings in fish otoliths
John Davenport	511	Oxygen consumption and ventilation rate at low temperatures in the Antarctic protobranch bivalve mollusc <i>Yoldia</i> (= <i>Aequiyoldia</i>) <i>eightsi</i> (Courthouy)
Totka M. Shivatcheva, Venzeslav K. Ankov and Asen I. Hadjioloff	515	Circannual fluctuations of the serum cortisol in the European ground squirrel, <i>Citellus citellus</i> L.
	519	Book Reviews

Vol. 90A, No. 4

Introduction

Erik Skadhauge and Jørgen Gomme	521
---------------------------------	-----

Presidential Address

H. H. Ussing	525	Odd behaviour of Li ⁺ in frog skin ion transport
--------------	-----	---

Section A: Regulation of Cell Volume and pH

J. Clive Ellory and Andrew C. Hall	533	Human red cell volume regulation in hypotonic media
John C. Parker	539	Volume-activated transport systems in dog red blood cells
Sergio Grinstein, Wendy Furuya, Patricia E. Nasmith and Ori D. Rotstein	543	Na ⁺ /H ⁺ exchange and the regulation of intracellular pH in polymorphonuclear leukocytes
Peter M. Cala, Steven E. Anderson and Edward J. Cragoe, Jr	551	Na/H exchange-dependent cell volume and pH regulation and disturbances
Kenneth R. Spring and Arthur W. Siebens	557	Solute transport and epithelial cell volume regulation

Section B: Gastrointestinal Ion Transport in Domestic Animals

G. Rechkemmer, K. Rönnaun and W. v. Engelhardt	563	Fermentation of polysaccharides and absorption of short chain fatty acids in the mammalian hindgut
H. Martens and G. Gäbel	569	Transport of Na and Cl across the epithelium of ruminant forestomachs: rumen and omasum. A Review
M. W. Smith	577	Postnatal development of transport function in the pig intestine
Wolfgang Clauss and Erik Skadhauge	583	Modulation of Na and Cl transport by mineralocorticoids
David H. Thomas and Erik Skadhauge	591	Transport function and control in bird caeca

Workshop on Intestinal Secretion

- Dan R. Halm, Gerhard Rechkemmer,
Robert A. Schoumacher and
Raymond A. Frizzell 597 Biophysical properties of a chloride channel in the apical
membrane of a secretory epithelial cell
- Ove Lundgren 603 Nervous control of intestinal fluid transport: physiology and
pathophysiology
- Ivar Lönnroth, Stefan Lange and
Erik Skadhauge 611 The antiseecretory factors: inducible proteins which modulate
secretion in the small intestine

Section C: Transport in Invertebrate Epithelia

- George A. Gerencser 621 Sodium and chloride transport across the molluscan gut
- Gregory A. Ahearn and Laurel P. Clay 627 Sodium-coupled sugar and amino acid transport in an acidic
microenvironment
- Stephen H. Wright 635 Amino acid transport in the gill epithelium of a marine bivalve
- J. E. Phillips, N. Audsley,
R. Lechleitner, B. Thomson, J. Meredith
and M. Chamberlin 643 Some major transport mechanisms of insect absorptive
epithelia
- Jørgen Gomme and Sten Albrechtsen 651 Problems of interpreting integumental D-glucose fluxes by the
integument of *Schistosoma*

Section D: Cellular Regulation of Transepithelial Transport

- Ann Taylor and David Marples 661 Regulation of membrane permeability by vasopressin; activation
of the water permeability pathway in toad urinary bladder by
N-ethyl-maleimide
- J. Bourguet, J. S. Hugon, G. Valenti
and M. Svelto 669 ADH-induced water permeability: what role for the micro-
tubular network?
- Robert Nielsen 673 Calcium modulates transepithelial potassium secretion across
isolated frog skin

Section E: Conductive Pathways in Epithelia

- P. Avenet, F. Hofmann and B. Lindemann 681 Signalling in taste receptor cells: cAMP-dependent protein
kinase causes depolarization by closure of 44 pS K-channels
- T. Zeuthen, P. M. Andersen,
K. E. Eskesen and B. D. Cherksey 687 Characterization of a purified co-transporting protein
- Willy Van Driessche, Jeannine Simaels,
Isabelle Aelvoet and David Erlij 693 Cation-selective channels in amphibian epithelia: electro-
physiological properties and activation
- Eberhard Frömter 701 Mechanisms and regulation of ion transport in the renal
collecting duct
- Erik Hviid Larsen and Knud Simonsen 709 Sulfate transport in toad skin: evidence for mitochondria-rich
cell pathways in common with halide ions

Section F: Secretory Epithelia

- O. H. Petersen 717 The control of ion channels and pumps in exocrine acinar cells
- Rolf K. H. Kinne 721 Sodium cotransport systems in epithelial secretion
- G. Sachs, S. Muallem and S. J. Hersey 727 Passive and active transport in the parietal cell
- R. Greger, H. Gögelein and E. Schlatter 733 Stimulation of NaCl secretion in the rectal gland of the dogfish
Squalus acanthias
- Birgitte Nauntofte and Steen Dissing 739 Cholinergic-induced electrolyte transport in rat parotid acini

Section G: Co- and Countertransport Systems

- | | | |
|--|------------|--|
| Heini Murer | 749 | Transport of sulfate and phosphate in small intestine and renal proximal tubule: methods and basic properties |
| Dan A. Klaerke and Peter L. Jørgensen | 757 | Role of Ca^{2+} -activated K^{+} channel in regulation of NaCl reabsorption in thick ascending limb of Henle's loop |
| C. H. van Os, L. A. M. van den Broek,
E. J. J. M. van Corven,
J. A. H. Timmermans and H. Dirven | 767 | Calcium homeostasis of epithelial cells |
| B. D. Cherksey | 771 | Functional reconstitution of an isolated sodium channel from bovine trachea |

Section H: Interaction of Osmotic and Volume Regulation

- | | | |
|---|------------|--|
| David J. Ramsay, Terry N. Thrasher
and Peter Bie | 777 | Endocrine components of body fluid homeostasis |
| G. Leng, R. E. J. Dyball and
J. A. Russell | 781 | Neurophysiology of body fluid homeostasis |
| Christa Simon-Oppermann,
Eckhart Simon and David A. Gray | 789 | Central and systemic antidiuretic hormone and angiotensin II in salt and fluid balance of birds as compared to mammals |

- | | | |
|---|------------|--|
| <u>Abstracts of Papers not Published in Full</u> | 805 | |
|---|------------|--|

